

100 Day Marathon AIML Prerequisites

Great decision! Before diving into your **100-day AI/ML project marathon**, it's important to build a strong foundation across key areas. Here's a structured list of **prerequisites**, broken into **core categories**, with **topics to master** and **resources** (free & beginner-friendly).

1. Python Programming (Essential for All Projects)

Topics:

- ☐ Variables, data types, functions, loops, conditionals
- ☐ Lists, dictionaries, sets, tuples
- ☐ File I/O
- ☐ Object-Oriented Programming (OOP)
- ☐ Exception Handling
- ☐ Basic modules: `os`, `random`, `math`, `time`

Resources:

- [W3Schools Python](#)
 - [Python for Everybody – Coursera](#)
 - [Python Crash Course – Google Colab](#)
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2. Data Analysis with pandas & NumPy

Topics:

- ☐ NumPy: Arrays, operations, broadcasting
- ☐ pandas: Series, DataFrames, indexing, filtering
- ☐ Data cleaning: missing values, duplicates

- ☐ Data transformation & grouping



Resources:

- [Kaggle pandas Course](#)
 - [NumPy Quickstart](#)
 - [pandas Official Docs](#)
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3. Data Visualization



Topics:

- ☐ Matplotlib: line plot, bar plot, scatter plot, histograms
- ☐ Seaborn: heatmaps, pairplots, boxplots
- ☐ Plotting from pandas



Resources:

- [Data Visualization with Matplotlib & Seaborn – Kaggle](#)
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4. Core Machine Learning (scikit-learn)



Topics:

- ☐ Supervised vs Unsupervised Learning
- ☐ Regression: Linear, Polynomial
- ☐ Classification: Logistic, KNN, SVM, Decision Trees
- ☐ Clustering: KMeans
- ☐ Model evaluation: Accuracy, Confusion Matrix, Precision/Recall, F1
- ☐ Cross-validation
- ☐ Feature scaling and encoding



Resources:

- [scikit-learn Crash Course – Google Developers](#)
- [ML Course by Andrew Ng – Coursera](#)
- [Kaggle ML Course](#)

5. Deep Learning

Topics:

- ☐ Neural Networks: perceptrons, backpropagation
- ☐ Activation functions: ReLU, sigmoid, softmax
- ☐ Loss functions and optimizers
- ☐ CNNs: filters, pooling, layers
- ☐ RNNs: sequences, LSTM, GRU
- ☐ Overfitting, regularization, dropout
- ☐ Transfer learning

Resources:

- [Deep Learning with PyTorch – FreeCodeCamp](#)
- [TensorFlow Basics – TensorFlow.org Tutorials](#)
- [Deep Learning Specialization – Coursera](#)

6. Computer Vision

Topics:

- ☐ OpenCV basics: reading images, drawing, filters
- ☐ Contours, edges, thresholding
- ☐ Face & object detection
- ☐ Real-time video processing
- ☐ Image classification & augmentation

Resources:

- [OpenCV Python Crash Course – YouTube](#)
- [CV Basics – LearnOpenCV](#)

7. Natural Language Processing (NLP)

✓ Topics:

- ☐ Text preprocessing: tokenization, stemming, lemmatization, stopwords
- ☐ Bag of Words, TF-IDF
- ☐ Text classification
- ☐ Named Entity Recognition (NER)
- ☐ Word embeddings (Word2Vec, GloVe)
- ☐ Transformers (BERT, GPT, T5)

Resources:

- [NLP with Python – Coursera \(by DeepLearning.ai\)](#)
 - [NLTK Book](#)
 - [HuggingFace Transformers Course](#)
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8. HuggingFace Transformers & LLMs

✓ Topics:

- ☐ Transformers 101
- ☐ Pretrained models (BERT, GPT, T5)
- ☐ Tokenizers
- ☐ Inference pipelines (summarization, classification, etc.)
- ☐ Fine-tuning models
- ☐ LangChain basics

Resources:

- [HuggingFace Transformers Course](#)
 - [LangChain Documentation](#)
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9. Model Deployment

✓ Topics:

- ☐ Flask & FastAPI for APIs

- ☐ Streamlit for interactive ML apps
- ☐ Deploying apps on Render, HuggingFace Spaces, or Heroku
- ☐ GitHub basics & CI/CD



Resources:

- [Streamlit Docs](#)
 - [FastAPI Docs](#)
 - [Deploy ML App on HuggingFace](#)
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10. Bonus: MLOps & Project Structure



Topics:

- ☐ Project structuring (data/ , src/ , models/ , notebooks/)
- ☐ Version control (Git/GitHub)
- ☐ ML lifecycle (data, model, deployment, monitoring)
- ☐ MLflow, DVC basics



Resources:

- [Made with ML – MLOps Guide](#)
 - [MLFlow Quickstart](#)
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Want a Visual Mindmap or Trello Board?

I can also give you:

- A visual **mind map** of the prerequisites
- A **Trello Notion board** to track your daily projects and learning
- A GitHub README template for your challenge

Would you like me to prepare one or more of those?